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E1S LR LW1 LW3

(56) Documents cited

GB A 2131475 US 4331217

GB A 2118236 US 4230202

GB 1145276 US 4194592

GB 1013250 US 3780828

US 4444291 US 3734236

US 4339020 US 3419109

(58) Field of search

E1S

## (54) Ladder stabilizing devices

(57) Frictional grip-boards (as defined in UK Patent Application No. 8235220, Serial No. 2131475A provide the basis for various devices which enhance the stability of ladders and expand their range of uses. Disclosed are:

1. A stand-off enabling the top of a ladder to be supported by a sloping roof without risk of slippage, and which may be fitted with a platform to provide a working surface and/or safe access to the roof, (Fig. 1).
2. A ladder stand-off for use on vertical walls, but with exceptional frictional grip and again the option of an added platform as a working aid, (Fig. 2).
3. Grip-boards adapted for clipping onto one side of a ladder so that it may be used as a self-adhering roof-scaling device without separate anchorage, (Fig. 3).
4. A supportive base employing on its underside a grip-board whose angle may be adjusted to accommodate sloping terrain, thus providing secure ladder placement in otherwise difficult locations, (Fig. 4).

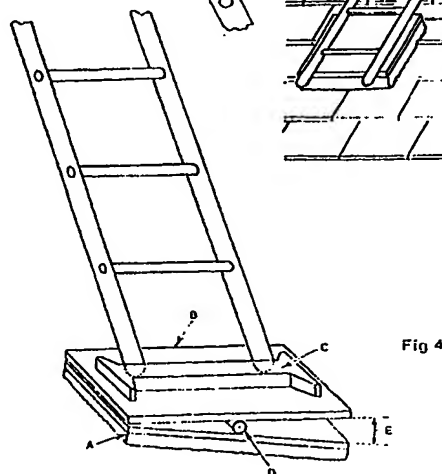
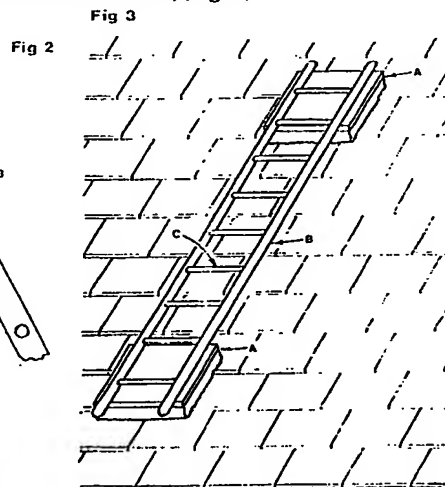
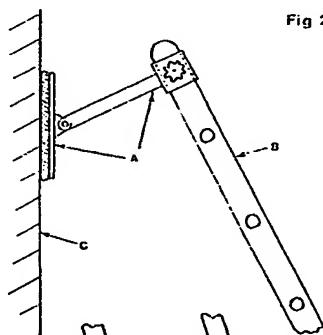
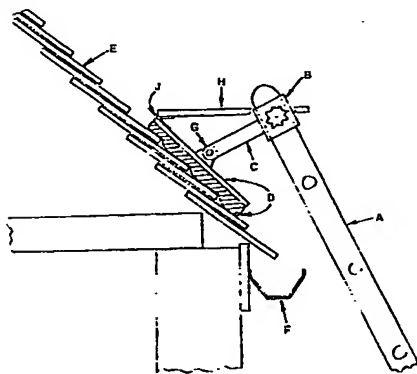
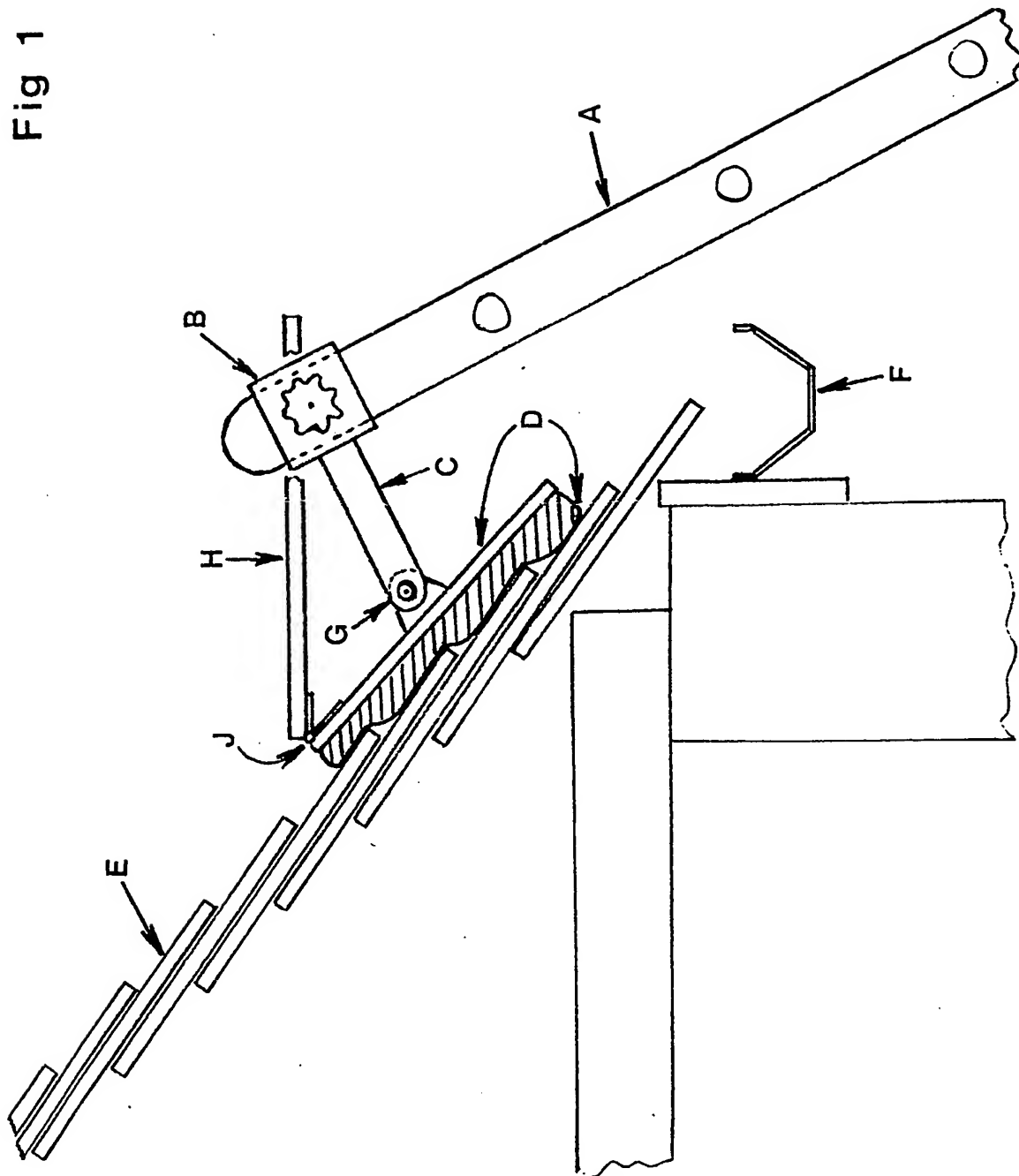


Fig 1



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Fig 2

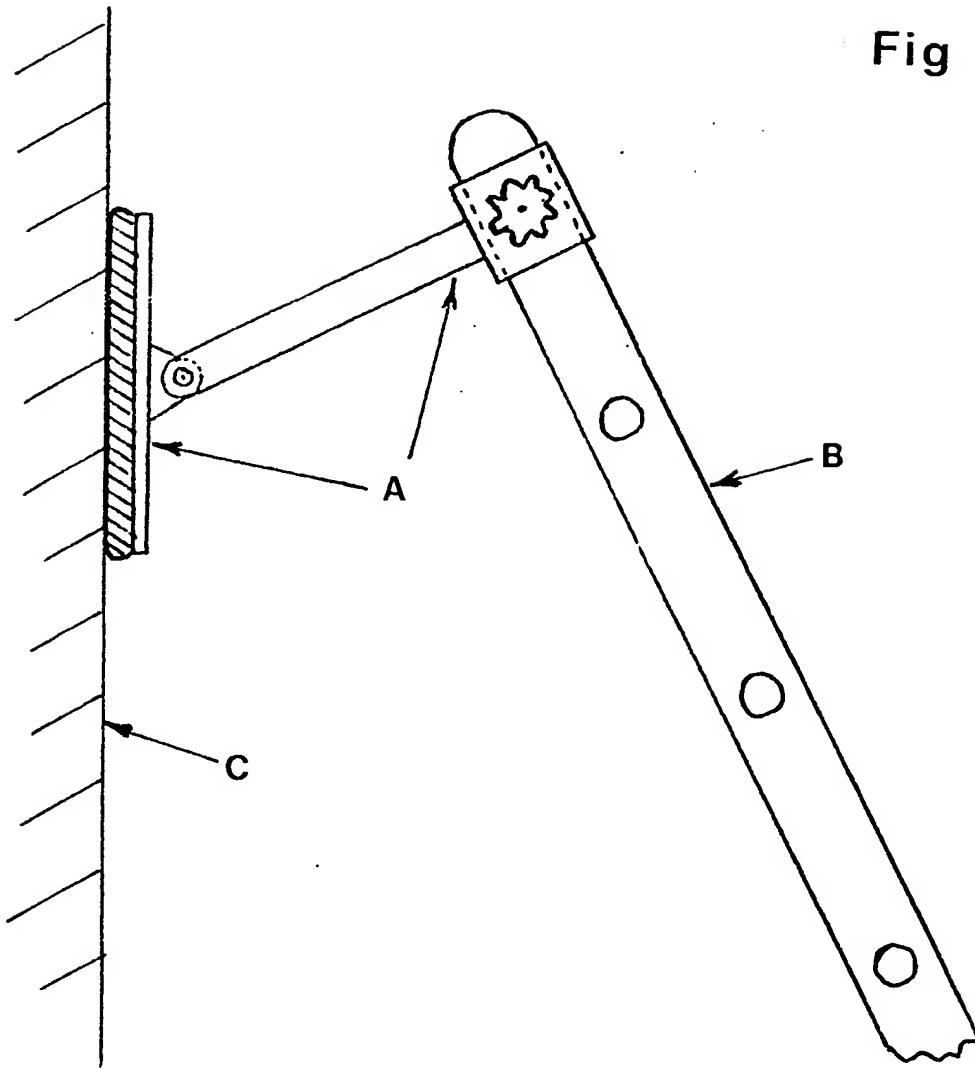
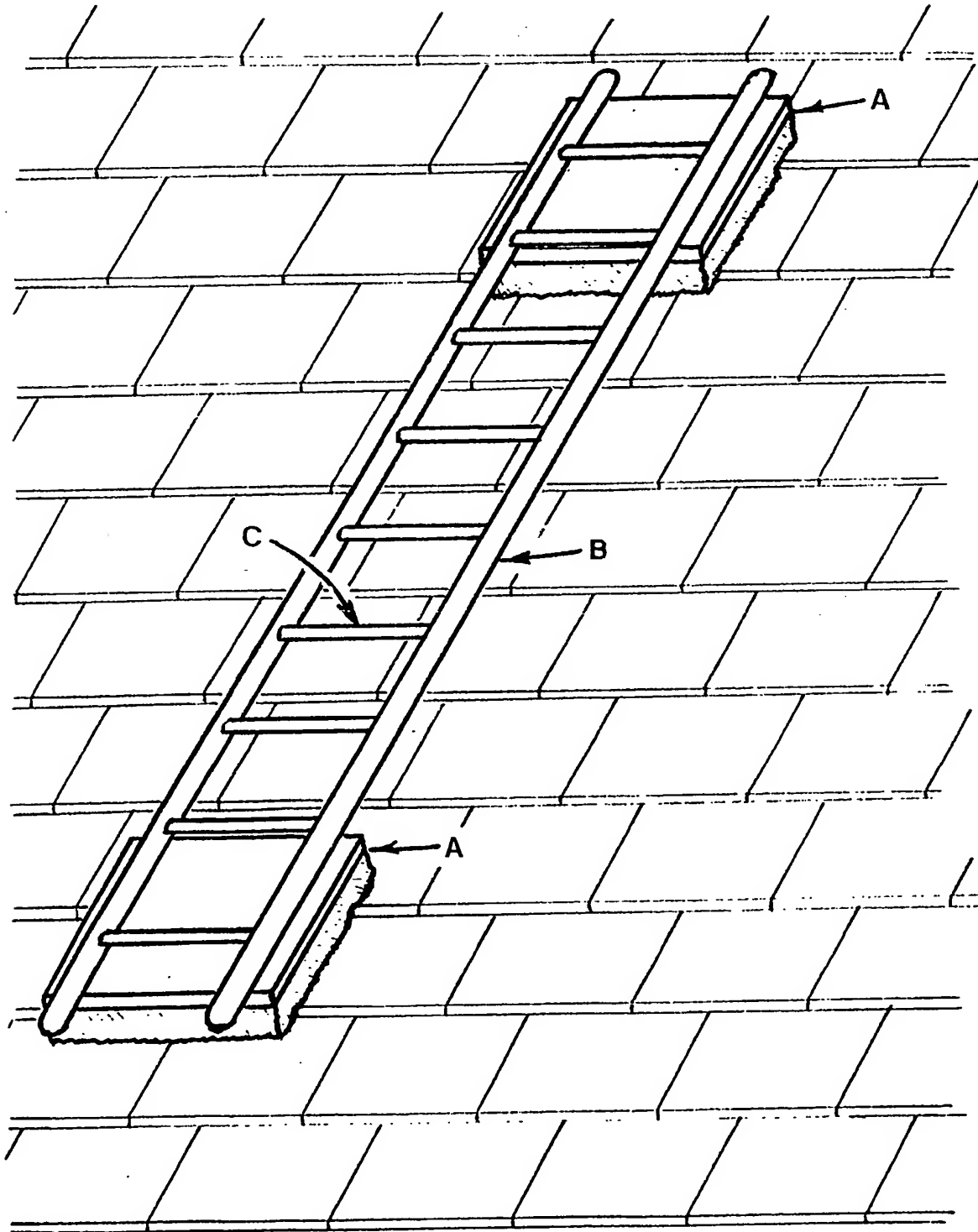


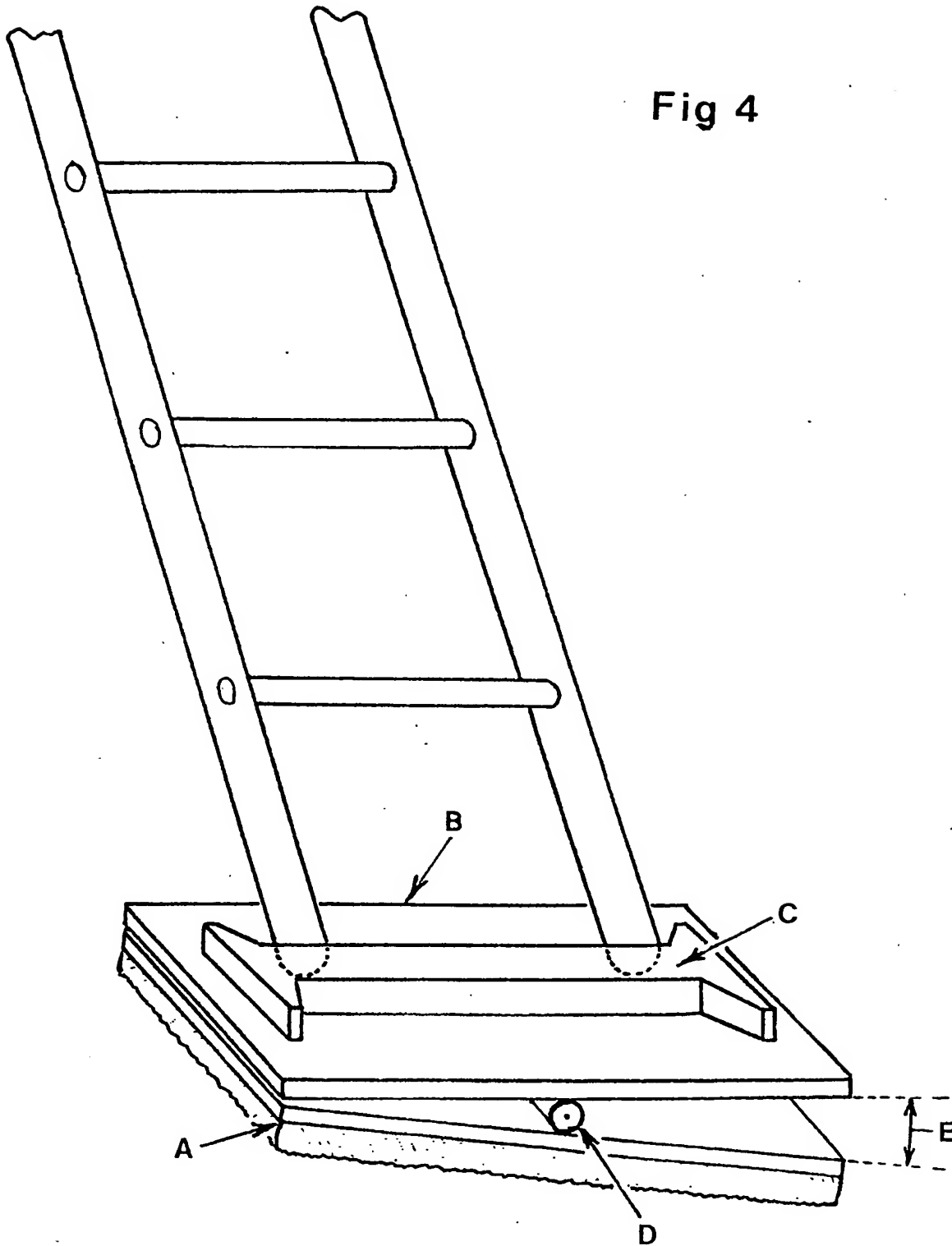
Fig 3



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Fig 4



## SPECIFICATION

## Ladder stabilizing devices

5 I, Henry John Frederick Crabbe, a British subject of  
303 Whitehorse Lane, South Norwood, London  
SE25 6UG, do hereby declare the invention for  
which I pray that a patent may be granted to me,  
and the method by which it is to be performed, to  
10 be particularly described in and by the following  
statement:-

This invention relates to devices which may be  
used in conjunction with, attached to or employed  
as integral parts of ladders, in order to enhance  
15 their mechanical stability and extend their range of  
functions. It employs flexible foams according to the  
principles discussed by the present claimant in co-  
pending U.K. Patent Application No. 8235220,  
wherein frictional grip-boards are described and  
20 their properties specified for use in self-contained  
roof-climbing appliances. Although in the light of  
lapsed British Patent 1145276 it would appear that  
a complete ladder permanently fitted with such  
grip-boards on one face is no longer protected, the  
25 present invention involves five self-contained de-  
vices which, while designed for use with ladders  
and employing the grip-board principle, are en-  
tirely new.

A common problem when a ladder is used to  
30 gain access to a roof or the upper parts of walls is  
that it has to rest on the gutter system, which may  
be unstable in various ways. Gutters are inclined to  
bend or crack when subjected to the extra load,  
and often provide smooth edges along which a  
35 ladder may slip dangerously. Also, if ones needs to  
stand upon the lower reaches of a sloping roof, the  
manoeuvres needed to effect a bodily transfer  
from ladder to tiles can be extremely hazardous,  
while at the same time tending to destabilize the  
40 ladder.

Such problems may be overcome by arranging  
that the ladder is supported by the roof itself, us-  
ing a grip-board whose width equals or exceeds  
that of the ladder and which is attached to the lat-  
45 ter at or near its top by means of bars or other ex-  
tensions which effectively bridge the gap while  
holding the ladder clear of all protrusions. Such an  
arrangement is shown in elevation in Figure 1,  
where the ladder A has the device fixed to its main  
50 vertical members by means of a pair of screw-  
clamps, one of which is shown at B. The actual fix-  
ing method employed may take various forms,  
possible involving spring-clips rather than clamps,  
and attachment to one or more of the ladder's  
55 cross-bars in addition to or instead of the verticals.  
The projecting members C are of such length that  
when the grip-board D has settled itself to the tiles  
E, the ladder is held clear of the gutter system F.  
Variations in roof pitch and ladder steepness are  
60 automatically accommodated by the grip-board's  
self-angling mounting arrangement G, which may  
comprise a hinge or a suitable vertical compliance.

The invention's second embodiment is also illus-  
trated in Figure 1, where the horizontal member H  
65 provides a work-platform, which in this version is

hinged at J. Once the grip-board is properly lo-  
cated on the roof, the platform H may be locked  
into a horizontal position by means of a ratchet or  
some similar adjustable mechanism. The weight  
70 from any load carried by the platform is then  
borne partly by the roof and partly by the ladder,  
while the latter's stability is actually enhanced  
when the user steps onto the platform, since this  
action automatically increases the ladder's own  
75 grip on the roof. The user thus has a safe and sta-  
ble means of standing on the lower part of a slop-  
ing tiled roof, from which position many common  
maintenance tasks may be performed. Also, the  
work-platform thus provided is an ideal base from  
80 which to use the various roof-climbing appliances  
described in the aforementioned co-pending Patent  
Application.

An alternative use for the self-angling grip-board  
extension is shown in Figure 2. Here, the device A  
85 is fitted to a ladder B, but without a work-platform  
and positioned simply to provide a stable high-fric-  
tion stand-off from a vertical wall surface C. This is  
necessary either when an adequate height cannot  
be achieved without resting the ladder upon a gut-  
90 ter or similar unsafe projection, or because the op-  
erative needs to be further out from the wall than  
is possible if the ladder itself were resting against  
the surface.

A further application of grip-boards in the exten-  
95 sion of ladder usage is illustrated in Figure 3. This  
is a perspective view of a ladder resting on a tiled  
roof, upon which it sits without sliding by virtue of  
a pair of grip-boards A fitted to its underside. It has  
been found that a typical 3m ladder section  
100 equipped with two grip-boards each of approxi-  
mately 900 sq.cm area (1 sq.ft) is completely stable  
within the limits set out for various tile materials  
and roof gradients in the co-pending Patent Appli-  
cation, and may be used as a roof ladder without  
105 the need for a grappling hook. The grip-boards are  
provided with clamps or clips which engage the  
ladder's side members B or rungs C in such man-  
ner that all the weight is securely applied to their  
upper surfaces, the ladder itself riding clear of the  
110 tiles at all times and being easily re-positioned up  
or across a roof as work progresses.

The invention's fifth embodiment is designed to  
overcome the difficulties arising when a ladder has  
to stand either on a very smooth surface or on a  
slope. The former encourages slippage, and the  
latter (if lateral) makes it difficult to keep the ladder  
vertical whilst retaining symmetrical contact with  
the upper supporting surface. Figure 4 illustrates  
the device, which employs a grip-board A that  
makes frictional contact with the floor or substra-  
120 tum to overcome the slippage problem, and an up-  
per part B on which the ladder stands. The latter  
has a locating member C, which may take any  
form that provides a stable abutment or recess for  
the ladder's feet. In order to maintain the upper  
125 member B in its required horizontal plane, there is  
a hinging mechanism (shown as a rocker D in the  
drawing) permitting the grip-board to accommo-  
date to the slope of the substratum, which in this  
case departs from horizontal by the angle E. Means  
130

must be provided for locking the upper and lower parts of the device at whatever angle provides correct positioning, and all such means are subsumed here under the general concept of an adjustable  
5 ladder-base employing a frictional grip-board.

#### CLAIMS

1. Devices for use in conjunction with ladders to  
10 facilitate safe access to pitched roofs and vertical walls, or to provide a stable base on sloping or slippery substrata, by virtue of the frictional properties of boards having undersides comprising a depth of flexible urethane foam, or other foam  
15 plastics, foam rubbers or materials with similar mechanical properties, such 'grip-boards' being as described and defined in co-pending U.K. Patent Application No. 8235220.

2. A stand-off which may be attached at or near  
20 the top of a ladder by any convenient means and whose supportive member comprises a grip-board or boards according to claim 1, the said board(s) being angled and pivoted or otherwise compliantly mounted such that its (their) underside(s) engages  
25 the lower reaches of a sloping roof's surface as the ladder is placed in position, thus providing a stable support while holding the ladder clear of protrusions.

3. A stand-off according to claim 2, fitted with a  
30 permanent or detachable platform which is horizontal along its lateral axis when the associated ladder is in its working position, and which may be either fixed or equipped with adjustable means for maintaining horizontality along its fore-and-aft axis  
35 over a range of roof pitches, to provide a level working surface onto which a person climbing the ladder may step to gain access to the roof, or on which materials can be stood.

4. A stand-off according to claim 2, but with its  
40 grip-board(s) so angled as to engage a vertical wall, thus holding the ladder away from such a wall while retaining a firm frictional grip upon it.

5. A stand-off according to claim 4, but fitted  
with a platform as in claim 3, such a platform pro-  
45 viding a surface on which materials may be stood while the user works from the ladder.

6. A universal ladder stand-off incorporating any combination of the facilities detailed in claims 2 to 5.

7. Two or more grip-boards according to claim  
50 1, with means for temporary but secure attachment to one side of a ladder to provide a high frictional grip, enabling the ladder to be placed up a sloping roof and used for scaling the roof without the need  
55 for other supports.

8. A base which provides a secure abutment for a ladder's feet, such a base carrying on its underside a grip-board according to claim 1, the inclination of which is adjustable to accommodate any  
60 slope or irregularity in the substratum while leaving the main body of the ladder-base horizontal, with means provided to lock the upper and lower parts of the device firmly together at whatever angle may be necessary to stabilize the ladder.

65 9. Grip-boards, stand-off, stand-offs with plat-

forms, and ladder-bases as hereinbefore described, with general reference to the drawings labelled Figures 1, 2, 3 and 4 accompanying the Specification.

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